

1 UNITED STATES PATENT AND TRADEMARK OFFICE

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4 BEFORE THE BOARD OF PATENT APPEALS  
5 AND INTERFERENCES  
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7  
8 *Ex parte* PER ALMDAHL and JEFFREY CHARLES EDWARDS  
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11 Appeal 2007-3756  
12 Application 10/501,325  
13 Technology Center 3600  
14

15  
16 Decided: December 14, 2007  
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19  
20 *Before:* TERRY J. OWENS, JENNIFER D. BAHR, and  
21 STEVEN D.A. McCARTHY, *Administrative Patent Judges.*  
22  
23 McCARTHY, *Administrative Patent Judge.*  
24

25 DECISION ON APPEAL

26  
27 STATEMENT OF THE CASE

28 The Appellants appeal under 35 U.S.C. § 134 (2002) from the final  
29 rejection of claims 7-9 and 15. We have jurisdiction under 35 U.S.C. § 6(b)  
30 (2002).

1       The Appellants' invention relates to a riser control device for use in  
2sub-sea oil and gas installations. Independent claim 7 and dependent claim  
38 are representative of the Appellants' claims and read as follows:

4

5               7.     A riser control device for use with  
6               spool or horizontal production trees for a well in  
7               sub-sea oil and gas installations, said device  
8               comprising:  
9               a housing;  
10              a pair of radially movable rams *disposed*  
11              *within said housing*, said rams being disposed in  
12              opposed relation for isolating the well;  
13              a pair of radially movable shear blades  
14              *disposed within said housing*, said blades being  
15              disposed in opposed relation for cutting off an  
16              intervention string; and  
17              *a vertically disposed actuator assembly,*  
18              *disposed within said housing, for simultaneously*  
19              *driving said rams and said blades.*

20              8.     The riser control device as claimed in  
21              claim 7, wherein said vertically disposed actuator  
22              assembly comprises *a hydraulically driven*  
23              *annular piston disposed in an annular chamber*, a  
24              piston rod connected to said piston, and a  
25              translation beam connected to said piston rod for  
26              transmitting movement of said piston to open or  
27              close said rams and blades.

28

29[Emphasis added.]

30       Claims 7-9 and 15 are rejected under 35 U.S.C. § 103(a) as being  
31unpatentable over Jones (U.S. Patent 4,580,626) in view of Owens (U.S.  
32Patent 4,441,742).

33       We affirm the rejection of claims 7 and 15. We reverse the rejection  
34of claims 8 and 9.

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## ISSUE

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The two issues in this appeal are:

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(1) whether the Examiner erred in contending that a riser control device including a housing and a vertically disposed actuator assembly disposed within the housing driving radially moving shear blades and rams, also disposed within the housing, would have been obvious from the blowout preventer [“BOP”] taught by Jones and the vertical actuator in Owens’ connector; and

10

(2) whether the Examiner erred in contending that Owens teaches an “annular piston.”

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## FINDINGS OF FACT

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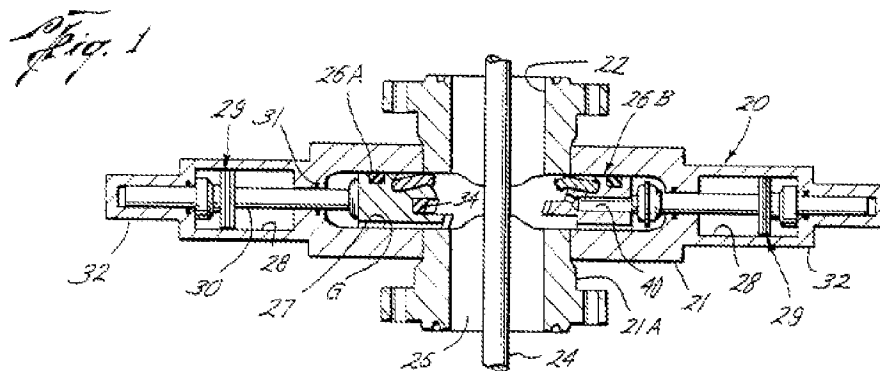
The record supports the following findings of fact (“FF”) by a preponderance of the evidence.

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1. Jones teaches what the Appellants characterize as a “known blowout preventer” [“BOP”]. (Br. 6). Figure 1 of Jones, reproduced below, is a side sectional view showing Jones’ BOP 20 in an open state with a pipe 24 extending through a bore 22 in the housing 21 of the BOP:

21



1        2.        The BOP includes a pair of radially disposed cylinders 28  
2opposed across the bore 22; a pair of pistons 29 reciprocable within the  
3cylinders; a pair of piston rods connected for movement with the pistons;  
4and pair of rams 26*A* and 26*B* mounted on the piston rods in opposing  
5relation for movement between an open position allowing access to a well  
6through the bore and a closed position isolating the well. (Jones, col. 7, ll.  
714-49). Each ram has a cutting blade (no reference numeral in Fig. 1) for  
8shearing the pipe 24 or other structure within the bore when the rams move  
9to the closed position. (Jones, col. 7, l. 50 – col. 8, l. 14). The cylinders, the  
10pistons, the piston rods, the rams and the cutting blades are disposed within  
11the housing 21. (Jones, Fig. 1).

12        3.        Owens teaches a remotely-operated connector designed to  
13secure the lowermost body of a BOP stack to an upright wellhead lower  
14body with a large clamping force. (Owens, col. 1, l. 5-8; col. 2, l. 65 – col.  
153, l. 2 and col. 3, ll. 49-52). The connector includes a housing secured to the  
16BOP stack body and vertically-disposed pistons and cylinders which drive  
17segment bodies radially into an annular groove in the wellhead body to  
18clamp the BOP stack onto the wellhead.

19        4.        More specifically, Owens' connector includes vertically  
20disposed cylinders and pistons coupled through piston rods to an annular  
21driving ring. The driving ring has a frusto-conical inner surface which  
22tapers downwardly and radially outwardly from the wellhead body. (Owens,  
23col. 4, l. 56 – col. 5, l. 20). The connector also includes frusto-conical  
24follower bodies having outer surfaces parallel to the inner surface of the  
25driving ring. (Owens, col. 4, ll. 42-50 and Fig. 1). Rollers separate the  
26facing frusto-conical surfaces of the driving ring and the follower bodies.

1(Owens, col. 5, ll. 21-32). Each follower body is connected by a connector  
2pin to one of the segment bodies. (Owens, col. 4, ll. 50-55).

3        5.        Vertical actuation of the pistons and cylinders drives radial  
4movement of the segment bodies. When the pistons and their associated  
5piston rods retract into the cylinders, the frusto-conical surface of the driving  
6ring slides downwardly relative to the facing frusto-conical surfaces of the  
7follower bodies. The rollers transfer this relative motion to the follower  
8bodies, deflecting the follower bodies and the segment bodies radially  
9inwardly toward the annular groove in the wellhead body. (Owens, col. 6, ll.  
1026-35). Owens teaches that this actuation assembly improves the efficiency  
11of the connector by reducing the sliding friction of the mechanism as  
12compared with the friction in conventional connectors. (Owens, col. 7, ll.  
1316-44).

14        6.        Owens' connector includes a housing. The housing includes a  
15segment-carrying ring designed to bolt onto a flange on the lowermost body  
16of the BOP stack; a transverse support plate extending radially outwardly  
17from the lower end of the segment-carrying ring; a transverse closure  
18member extending radially outwardly from the upper end of the segment  
19carrying ring; and a cylindrical outer wall member bridging the outer edges  
20of the transverse support plate and the transverse closure member. The  
21cylinders, the pistons, the driving ring and the follower bodies are all  
22disposed in an annular space within this housing. The segment bodies are  
23disposed within annular grooves in the segment-carrying ring. (Owens, col.  
244, ll. 3-29 and Fig. 1).

1 PRINCIPLES OF LAW

2 A claim is unpatentable for obviousness under 35 U.S.C. § 103(a) if  
3 “the differences between the subject matter sought to be patented and the  
4 prior art are such that the subject matter as a whole would have been obvious  
5 at the time the invention was made to a person having ordinary skill in the  
6 art to which said subject matter pertains.” In *Graham v. John Deere Co.*,  
7 383 U.S. 1 (1966), the Supreme Court set out factors to be considered in  
8 determining whether claimed subject matter would have been obvious:

9  
10 Under § 103, the scope and content of the prior art  
11 are to be determined; differences between the prior  
12 art and the claims at issue are to be ascertained;  
13 and the level of ordinary skill in the pertinent art  
14 resolved. Against this background the obviousness  
15 or nonobviousness of the subject matter is  
16 determined.  
17

18 *Id.*, 383 U.S. at 17.

19 In order to establish a prima facie case that claimed subject matter is  
20 obvious, the examiner must articulate reasons consistent with the level of  
21 ordinary skill in the art at the time of the invention why (in the words of 35  
22 U.S.C. § 103(a)) “the differences between the subject matter sought to be  
23 patented and the prior art are such that the subject matter as a whole would  
24 have been obvious at the time the invention was made to a person having  
25 ordinary skill in the art to which said subject matter pertains.” The examiner  
26 must derive these reasons from what was within the common knowledge or  
27 common sense of those skilled in the art at the time of the invention and not  
28 from the applicant’s specification. See *Graham*, 383 U.S. at 36 (warning  
29 against “the temptation to read into the prior art the teachings of the

1invention at issue”). On the other hand, the reasons need not be stated  
2explicitly in a prior art reference. *KSR*, 127 S.Ct. at 1741 (“[T]he analysis  
3need not seek out precise teachings directed to the specific subject matter of  
4the challenged claim . . .”). The examiner may look to “interrelated  
5teachings of multiple patents; the effects of demands known to the design  
6community or present in the marketplace; and the background knowledge  
7possessed by a person of ordinary skill in the art, all in order to determine  
8whether there was an apparent reason to combine the known elements in the  
9fashion” recited in the claim. *Id.* at 1740-41.

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11 ANALYSIS

12 The Appellants offered arguments regarding the patentability of  
13appealed claims 7-9 and 15 in general. In addition, the Appellants offered  
14arguments directed specifically to the language of claim 8. (Br. 11).<sup>1</sup>  
15Therefore, the Board will consider claims 7 and 15 as a group, with claim 7  
16being deemed representative of the group. 37 C.F.R. § 41.37(c)(vii) (2007);  
17*In re Dillon*, 919 F.2d 688, 692 (Fed. Cir. 1990) (*en banc*). The Board will  
18consider the patentability of claim 8 and claim 9, which depends from claim  
198, separately.

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21A. *The Subject Matter of Claims 7 and 15 is Obvious from Jones in Light*  
22 *of Owens*

23 The first two steps in determining whether the Examiner has  
24established a prima facie case for obviousness are to determine the scope

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25<sup>1</sup> The Board notes that the Appellants did not provide a separate  
26subheading for the argument addressing claim 8. *See* 37 C.F.R.  
27§ 41.37(c)(vii) (2007).

1and content of the prior art; and to ascertain the differences between the  
2prior art and the claims at issue. The prior art of record includes the  
3teachings of Jones and Owens. Jones teaches a BOP which includes a pair  
4of radially movable rams (26A and 26B in Fig. 1, reproduced above)  
5disposed in opposed relation for isolating the well; a pair of radially movable  
6shear blades disposed in opposed relation for cutting off an intervention  
7string; and an actuator assembly (28-31 in Fig. 1) for simultaneously driving  
8the rams and the blades. (FF 2). Jones' BOP differs from the claimed  
9subject matter in that Jones fails to disclose a "vertically disposed actuator  
10assembly" for driving the rams and the blades; and a housing within which  
11the rams, the blades and the vertically disposed actuator assembly are  
12disposed. These elements are taught by Owens.

13       The third step in determining whether the Examiner has established a  
14prima facie case for obviousness is to resolve the level of ordinary skill in  
15the art. The factors which may be considered in determining the level of  
16ordinary skill include the teachings of the prior art references themselves and  
17the sophistication of the technology. *Daiichi Sankyo Co. v. Apotex, Inc.*, 501  
18F.3d 1254, 1256 (Fed. Cir. 2007). Those skilled in the art would have been  
19aware that sub-sea structures are exposed to the pressure and corrosive  
20effects of seawater. (*E.g.*, Owens, col. 1, l. 61 – col. 2, l. 6). Common sense  
21would have dictated the desirability of enclosing sensitive parts in protective  
22 housings. The construction of a suitable housing would not require  
23sophisticated technology and would be within the skill in the art, as  
24illustrated by the housing described in Owens. (*See* FF 5).

25       The final step in determining whether the Examiner has established a  
26prima facie case of obviousness is to determine whether the Examiner



1articulated reasons why the differences between the subject matter sought to  
2be patented and the prior art are such that the subject matter as a whole  
3would have been obvious to a person having ordinary skill in the art. The  
4reasons for combining the teachings of the prior art may arise from the  
5nature of the combination itself. For example, it generally is obvious to use  
6a technique already known to improve one device in order to improve  
7another similar device. *Leapfrog Enterps. v. Fisher-Price, Inc.*, 485 F.3d  
81157, 1162 (Fed. Cir. 2007).

9        In the present case, it would have been obvious to improve Jones’  
10conventional BOP by using the vertically disposed actuation assembly  
11taught in Owens. Owens teaches that the vertically disposed actuator  
12assembly described therein improves the efficiency with which hydraulic  
13pressure is converted into radial sliding motion. (FF 4). Since the range of  
14movement of the rams in Jones’ BOP and the segment bodies in Owens’  
15connector are similar, one of ordinary skill in the art could have predicted  
16that the application of Owens’ vertically disposed actuator assembly to  
17Jones’ BOP would have improved the shearing force of the blades for a  
18given hydraulic power input. Therefore, the use of Owens’ vertically  
19disposed actuator assembly in a BOP of otherwise conventional design such  
20as Jones’ would have been obvious.

21        The Appellants argue that if the teachings of Jones and Owens are  
22combined, “the resulting structure would simply be a combined BOP and  
23connector.” (Br. 9). The criterion for obviousness is “not whether the  
24references could be physically combined but whether the claimed inventions  
25are rendered obvious by the teachings of the prior art.” *In re Etter*, 756 F.2d  
26852, 859 (Fed. Cir. 1985). Prior art references may teach more than their

1preferred embodiments. The teachings of the prior art include (but are not  
2limited to) the problems which the references address and any improvements  
3which the references advance as solutions to those problems. In the present  
4case, both the use of Owens' connector to secure Jones' BOP onto a  
5wellhead and, more pertinently, the substitution of Owens' vertically  
6disposed actuator assembly for the radially disposed assembly of Jones  
7would have been obvious from the teachings of the references.

8       The Appellants contend that "Owens teaches that the connector  
9mechanism is provided in a separate housing or pocket on the *outside* of the  
10well housing. This is clearly different from the device defined in claim 7 in  
11which the vertically disposed actuator assembly is provided inside the  
12housing of the riser control device." (Br. 10 [emphasis in original]). Owens  
13suggests (as common sense would have suggested) the disposition of  
14sensitive parts such as the actuator assembly, the rams and the blades in a  
15protective housing. In other words, the disposition of these parts in a BOP  
16housing would have been obvious.

17       Claim 7 is not limited to a riser control device housed inside the well  
18housing. "During examination, 'claims . . . are to be given their broadest  
19reasonable interpretation consistent with the specification, and . . . claim  
20language should be read in light of the specification as it would be  
21interpreted by one of ordinary skill in the art.'" *In re American Acad. Of*  
22*Science Tech Ctr.*, 367 F.3d 1359, 1364 (Fed. Cir. 2004) (quoting *In re*  
23*Bond*, 910 F.2d 831, 833 (Fed. Cir. 1990)). Nevertheless, although claims  
24are to be read in light of the specification, they are limited only by their  
25language and not by features of the preferred embodiment disclosed in the  
26specification. *In re Van Geuns*, 988 F.2d 1181, 1184 (Fed. Cir. 1993).

1        Given its broadest reasonable interpretation, the term “housing” as  
2used in claim 7 is not limited to the well housing. Jones’ use of the term  
3“housing” to refer to the entire structure enclosing Jones’ BOP, including the  
4both the portion of the housing in line with the well head and the horizontal  
5pockets in which the cylinders are formed (*See, e.g., Jones, col. 7, ll. 14-20,*  
636-44 and 50-54), suggests that those of ordinary skill in the art would not  
7understand the term “housing” to be limited to the well housing alone.  
8Nothing in the specification suffices to prove use of the term “housing” to  
9refer only to the well housing. Therefore, the term “housing” as used in  
10claim 7 is broad enough to encompass a riser

11        The Appellants have submitted no evidence sufficient to rebut the  
12prima facie case. On the record before us, the subject matter of claim 7 was  
13obvious. Claim 15 falls with claim 7. On the record before us, the  
14Appellants failed to show that the Examiner erred in rejecting claims 7 and  
1515 under 35 U.S.C. § 103(a).

16

17B.        *The Subject Matter of Claims 8 and 9 is Not Obvious from Jones in*  
18        *Light of Owens*

19        The Examiner rejected claims 8 and 9 as unpatentable over Jones in  
20light of Owens. Jones’ BOP differs from the subject matter of claim 8 in  
21that Jones’ BOP does not include a “vertically disposed actuator assembly”  
22having “a hydraulically driven annular piston disposed in an annular  
23chamber.” There is insufficient evidence in the record from the teachings of  
24Owens or otherwise to show that the incorporation of this feature into a riser  
25control device was within the level of ordinary skill in the art. On the record



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1 DECISION

2 The Examiner's rejection of claims 7 and 15 is affirmed. The  
3Examiner's rejection of claims 8 and 9 is reversed.

4 No time period for taking any subsequent action in connection with  
5this appeal may be extended under 37 C.F.R. § 1.136(a). *See* 37 C.F.R.  
6§ 1.136(a)(1)(iv) (2007).

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8 AFFIRMED IN PART AND REVERSED IN PART

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